

NON-PUBLIC?: N  
ACCESSION #: 9505020267  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: South Texas Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000499

TITLE: Reactor Trip on Over Temperature/Delta Temperature due to  
a Failed Fuse Holder  
EVENT DATE: 03/28/95 LER #: 95-003-00 REPORT DATE: 04/26/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Jairo Pinzon - Staff Engineer TELEPHONE: (512) 972-8027

COMPONENT FAILURE DESCRIPTION:  
CAUSE: X SYSTEM: JG COMPONENT: FUB MANUFACTURER: W120  
REPORTABLE NPRDS: YES

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On March 28, 1995, Unit 2 was in Mode 1 at 100% power. At approximately 0832 hours, Unit 2 experienced a reactor trip on Over Temperature/Delta Temperature due to a failed fuse holder. At the time of this event, Instrument and Control Technicians were performing setpoint changes in the Protection System Loop 1, Channel 1 (loop 410) Over Temperature/Delta Temperature instrumentation with the channel in trip. During the performance of this setpoint change, Loop 4, Channel 4 (loop 440) generated a spurious trip signal which actuated the second logic channel required to complete the two out of four coincidence logic, resulting in a reactor trip. The cause of this event is a failure of the Protection Channel 4 primary power supply fuse holder in Card Frame 2. The fuse holder was found broken on the back side of the holder where the wiring lugs are attached. The fuse was in intermittent contact with the terminal lugs, resulting in spurious arcing from the terminal lug to the fuse. This arcing created spikes with a subsequent Channel 4 Over

Temperature/Delta Temperature bistable trip. Corrective actions include replacing the defective fuse and fuse holder, performing thermographic surveys of the Unit 1 and Unit 2 process and control cabinet power supply fuses to identify degraded components, and revising the associated preventive maintenance procedures to include the monitoring of the protection set panel meters to detect load sharing, and sharing the lessons learned with other nuclear stations.

LER-95\95003U2.000 04/26/95 (1:12pm)

END OF ABSTRACT

TEXT PAGE 2 OF 3

#### DESCRIPTION OF EVENT:

On March 28, 1995, Unit 2 was in Model 1 at 100% power. At approximately 0832 hours, Unit 2 experienced a reactor trip on Over Temperature/Delta Temperature due to a failed fuse holder. At the time of this event, Instrument and Control Technicians were performing setpoint changes in the Protection System Loop 1, Channel 1 (loop 410) Over Temperature/Delta Temperature instrumentation with the channel in trip. These setpoint changes were required to implement the VANTAGE 5 Fuel Upgrade Technical Specification changes.

Channel 1 was placed in the trip condition to facilitate the setpoint changes. Placing Channel 1 to trip, actuated one logic channel of the two out of four coincidence logic required for a reactor trip. During the performance of this setpoint change, Loop 4, Channel 4 (loop 440) generated a spurious trip signal. This spurious trip signal actuated the second logic channel required to complete the two out of four coincidence logic, resulting in a reactor trip. There were no work activities being performed on Loop 4, Channel 4.

Following the reactor trip, Steam Generator Feedwater Pump #21 seized and the Main Turbine Bearing Lift Pump failed to start. These equipment malfunctions have been addressed per the South Texas Project Corrective Action Program.

#### CAUSE OF EVENT:

The cause of this event is a failure of the Protection Channel 4 primary power supply fuse holder in Card Frame 2, as a result of elevated temperatures over an extended period of time. The fuse holder was found broken on the back side of the holder where the wiring lugs are attached. The fuse was in intermittent contact with the terminal lugs resulting in

spurious arcing from the terminal lug to the fuse. This arcing created spikes with a subsequent Channel 4 Over Temperature/Delta Temperature bistable trip.

Following thermographic surveys of similar process and control cabinet fuse holders, Westinghouse was contacted to determine the effects of elevated temperatures on the fuse holders. Westinghouse stated that a threshold temperature exists which should result in an evaluation to determine if replacement of the fuse holder is required. Since it was not known how long the fuses had been experiencing these temperatures, a decision was made to replace those fuses which were found to be greater than 75 degrees C.

#### ANALYSIS OF EVENT:

Reactor trips and Engineered Safety Features actuations are reportable pursuant to 10CFR50.73(a)(2)(iv). All Engineered Safety Features systems functioned as designed. Auxiliary Feedwater actuated on low Steam Generator Level and Feedwater Isolation actuated on low average reactor coolant temperature coincident with a reactor trip. The plant responded to the reactor trip normally and support systems operated as designed except for Steam Generator Feedwater Pump #21 and the Main Turbine Bearing Lift Pump. There were no adverse safety or radiological consequences as a result of this event.

LER-95\95003U2.000 04/26/95 (9:49am)

TEXT PAGE 3 OF 3

#### CORRECTIVE ACTIONS:

1. The defective fuse and fuse holder were replaced. The affected channel surveillance test (loop 440) was reperformed and the channel was returned to service on March 29, 1995.
2. Thermographic survey of the Unit 1 and Unit 2 process and control cabinet power supply fuses were performed to identify degraded components. Twelve fuses were replaced in Unit 1 and eleven fuses were replaced in Unit 2.
3. The associated preventive maintenance procedures will be revised to include the monitoring of the protection set panel meters for those that have auctioneered power supply sources, to detect load sharing. This action will be completed by August 1, 1995.
4. The lessons learned from this event have been provided to other

nuclear stations via Nuclear Network.

Thermographic inspections have been conducted on these cabinets on a quarterly basis since 1990. Baseline data obtained on the fuse holder caps showed deviation in temperatures between various card frames and cabinets. The deviation in temperatures was attributed to the current loading on the card frames. No substantial changes in maximum temperatures were observed on the fuse holder caps during the course of the last five years. However, as a result of this event, the fuse holder cap temperatures will be trended to help assess the condition of the fuse holders and prevent future failures. Based on discussions with Westinghouse, an upper limit temperature threshold was established for the process and control cabinet fuse holders. Process and control cabinet fuse holders found above this temperature threshold will be scheduled for replacement.

#### ADDITIONAL INFORMATION:

The fuse holder is supplied through Westinghouse by the Tracor Little Fuse Company. The fuse holder model number is 342028.

There have been no similar events reported to the Nuclear Regulatory Commission.

\*\*\* END OF DOCUMENT \*\*\*

---